

**AN ANALYSIS OF
APPLE PRICES
ON THE
CLEVELAND WHOLESALE
PRODUCE MARKET**

WILLIAM H. HENDRICKS and M. E. CRAVENS



**OHIO AGRICULTURAL
EXPERIMENT STATION
Wooster, Ohio**

CONCLUSIONS

In general, the higher price differences between grades of apples from western sources was believed to be due to the more exact grading practiced among the western than eastern packers. Eastern packers are believed to be more inclined to include many U.S. Extra Fancy apples in the U.S. Fancy pack and U.S. Fancy apples in the U.S. No. 1 pack. A more detailed study would be needed to determine this as fact and to further determine if more exact grade sorting would pay the eastern packer.

Another deviation affecting the analysis was uncovered by visiting the market and talking with the market news reporter and commission dealers. One eastern shipper, whose apples were regularly on the market consistently obtained prices that were above the market average for apples of similar grade and size. The reason this was possible went back to care in production and harvesting and to the marketing program where he "set" his price and only supplied the market with what would sell at the price set. Some of the deviations in McIntosh prices are believed to be due to this program and possibly to others not discovered. These variations represent useful marketing facts, but are a source of weakness in an analysis such as this. This is more true for apples from eastern than those from western sources.

This study uncovered no general pattern of relationship between grade, size, type of pack, type of package and apple price that seemed to apply to all three varieties. There were significant differences for each variety, however, that persisted over the three year period.

Some of the differences in apple prices appeared to be due to the method of grading, sizing or packing and not in differences in the quality of the fruit. To the extent that this was the case it would have paid dividends to the seller who observed and catered to these market preferences. Among these were an apparent preference for count sizing over minimum diameter sizing and of the cell pack over the tray. Extra costs must be considered in any decision by the packer. This analysis found no substitute for the day-to-day observation and appraisal of market prices and the causes of their variation.

AN ANALYSIS of APPLE PRICES on the CLEVELAND WHOLESALE PRODUCE MARKET

WILLIAM H. HENDRICKS and M. E. CRAVENS

For more than 30 years the produce buying and selling transactions on the Cleveland Wholesale market have been reported in summary form each day by the United States Department of Agriculture. Prices are reported by grade, size, condition, source, variety, method of packing, type of package and market situation. These reports for the August-March periods for the three crop years 1954, 1955 and 1956 form the basis for this analysis.

OBJECTIVE OF THIS STUDY

To determine the relationship between the various grade, size, varietal, pack and package factors, on prices of apples on the Cleveland Wholesale Market.

It was intended that the analysis would improve grower knowledge of the demands of the market through a statistical interpretation of the mass of information found in the market news reports.

METHODOLOGY AND PROBLEMS

The terminology used in this report must of necessity conform to that of the market news reports rather than to proper horticultural or varietal usage. Hence, the terms "Red" Delicious and Delicious are differentiated in the reports and the analysis although both are red in color.

The prices taken from the reports were adjusted before analysis in order to remove variations in prices from month to month and from year to year. The weighting was on the basis of the importance of each state in supplying the Cleveland market. Table 1 shows the proportion of the total unloads on the Cleveland market that were from each of the major states. Table 2 shows the seasonal indexes based on USDA reported farm prices for those states shipping apples to Cleveland. These indexes were used to adjust the prices before analysis of the effects on price of variety, grade, size, and other factors.

Another adjustment was necessitated by the fact that often several different sizes, packs and types of apples are quoted at the same price,

Table 1.—Percent of Total Carlot Shipments of Apples from Four Selected States, Cleveland, Annually, Crop Years, 1954-1956

State of Origin	Percent of Total Carlot Shipments		
	1954	1955	1956
Michigan	10.2	1.5	36.6
New York	28.9	28.3	15.5
Ohio	18.3	27.6	22.8
Washington	24.6	24.5	12.7
Other	18.0	18.1	12.4
Total	100.0	100.0	100.0

Source: United States Department of Agriculture, Agricultural Marketing Service, Annual Summary, **Unloads of Fresh Fruits and Vegetables, Cleveland, 1954-56, Cleveland, Ohio.**

i. e. Delicious U. S. Fancy, Ctns., Ctns. and Bskts., 2½ and up \$4.50-\$4.75. Where this occurred, a separate price listing was made for the analysis for each variation listed i.e. Del. U. S. Fancy, Crt. \$4.50-\$4.75; Del U. S. Fcy., Ctn. \$4.50-\$4.75 etc.

The average of the high-low price quotation was used (i. e. \$4.50-\$4.75 was taken at \$4.62) unless mostly was given where the mostly figure was used.

All apples were considered as having either an eastern or a western origin. Western included all shipments from the pacific coastal states while eastern included all east of the rocky mountains.

All price comparisons were made by grouping sales prices of apples having like characteristics and comparing them with those with

Table 2.—Monthly Index of Apple Prices Received by Growers, Weighted by Carlot Shipments to Cleveland, Crop Years, 1954-1956
(Three year weighted average price = 100)

Months	Weighted Price Indexes		
	Crop Years		
	1954-1955	1955-1956	1956-1957
August	108.7	101.29	83.26
September	99.33	83.31	90.06
October	99.88	85.13	83.72
November	107.00	94.66	90.57
December	114.24	100.06	105.82
January	116.53	96.69	105.34
February	106.95	95.74	112.32
March	110.30	93.82	115.28

different characteristics. The significance of price differences between groups was determined by analysis of variance.

"Red" Delicious, Delicious and McIntosh sales were analyzed. Price difference of each of the three "varieties," "Red" Delicious, Delicious and McIntosh, were analyzed separately.

"RED" DELICIOUS

Western "Red" Delicious on the Cleveland market averaged \$6.10 per bushel while eastern apples sold on the average for \$4.93; a difference of \$1.17 cents per bushel (Tables 3 and 4). Most western ap-

Table 3.—Average Price in Dollars Per Bushel and Number of Price Quotations by Grades for Eastern "Red" Delicious Apples, 1954-56 Crop Years

Grade	Number of Price Quotations	Average Price
U. S. Extra Fancy	1452	5.55
Combination U. S. Extra Fancy and Fancy	703	4.77
U. S. Fancy	1955	4.84
U. S. No. 1	1263	4.45
Total and Average	5373	4.93

ples marketed were graded Extra Fancy and packed by count, each apple of the package being uniform in size. Eastern apples accounted for roughly 73 percent of the "lots" traded in the "Red" Delicious variety and a large percentage of these were marked U.S. Fancy or U.S. No. 1. Within the two regions, western and eastern, there were variations in prices paid for different grades of apples, different sizes, different methods of packing and certain combinations of these factors.

Table 4.—Average Prices in Dollars Per Bushel and Number of Price Quotations by Grades for Western "Red" Delicious Apples, 1954-56 Crop Years

Grade	Number of Price Quotations	Average Price
U. S. Extra Fancy	1531	6.38
Extra Fancy and Fancy	35	5.34
U. S. Fancy	425	4.91
Total and Average	1991	6.10

THE EFFECT OF GRADE ON PRICES PAID FOR EASTERN "RED" DELICIOUS APPLES

Eastern "Red" Delicious were marketed primarily in four grades, U.S. Extra Fancy, Combination Extra Fancy and Fancy, U.S. Fancy, and U.S. No. 1. The relative proportion each grade made of the total quotations during the three years was as follows: U.S. Extra Fancy, 22 percent; Extra Fancy and Fancy, 13 percent; U.S. Fancy, 36 percent; U.S. No. 1, 24 percent.

"Red" Delicious graded U.S. Extra Fancy were highest in price at \$5.55 while those graded U.S. No. 1 were lowest at \$4.45 (Table 3). The difference in prices paid for these two grades was \$1.10. The average prices paid for "Red" Delicious graded Combination Extra Fancy and Fancy were seven cents less than the average prices paid for this variety of apples graded U.S. Fancy.

THE EFFECT OF GRADE ON PRICES PAID FOR WESTERN "RED" DELICIOUS APPLES

Western "Red" Delicious shipped to Cleveland were primarily marketed in two grades; U.S. Extra Fancy and U.S. Fancy. Western "Red" Delicious Apples graded Combination Extra Fancy and Fancy accounted for less than two percent of the total price quotations made for this variety of apples.

A higher proportion of the better grades of "Red" Delicious apples was placed on the market by western than by eastern shippers. Seventy-five percent of the western "Red" Delicious were graded U.S. Extra Fancy and 25 percent were graded U.S. Fancy (Table 5). In contrast to this, only 27 percent of the eastern "Red" Delicious were graded U.S. Extra Fancy while 36 percent were marked U. S. Fancy (Table 3). In addition, 23 percent of the eastern "Red" Delicious were marketed as U.S. No. 1 Grade.

The average price paid for western U.S. Extra Fancy "Red" Delicious was \$6.38 per bushel, while apples of this variety graded U.S. Fancy averaged \$4.91. The resultant price difference of \$1.47 per bushel indicated the premium which buyers were willing to pay for the top grade western "Red" Delicious apples. These differences were highly significant.

Analysis of variance was used to determine the degree of significance of differences between the prices paid for western Extra Fancy and U.S. Fancy grades of "Red" Delicious. The sizes included in the analysis were 56's-72's, 80's-92's, 96's, 100's, and 113's. Prices used

Table 5.—Number of Observations of Different Size “Red” Delicious Apples by Grade, Crop Years 1954-1956

Size of Apple	Grade				Total Observations by size
	U. S. Extra Fancy	Extra Fancy and Fancy	U. S. Fancy	U. S. No. 1	
	(Number of Observations)				
56-72	361	104	163	4	632
80-92	525	132	433	55	1145
96	261	80	342	53	736
100	324	86	373	124	907
113	492	87	169	113	861
120-125	301	76	379	149	905
135-138	669	164	340	36	1209
150-160	50	4	152	6	212
2 ½ "-3" up	—	5	29	723	757
Total	2983	738	2380	1263	7364

in the analysis were for tray packed Extra Fancy grade and wrapped U. S. Fancy grade (Tables 13 and 14). Insufficient numbers of price quotations prevented tray packed U.S. Fancy from being used in the analysis.

COMPARISON OF PREMIUMS PAID FOR EASTERN AND WESTERN “RED” DELICIOUS APPLES BY GRADES

Western Extra Fancy “Red” Delicious apples averaged \$1.47 per bushel higher in price than those graded U. S. Fancy, while eastern “Red” Delicious graded U. S. Extra Fancy averaged only \$.71 per bushel above the prices paid for U. S. Fancy. Thus, the premiums paid for Extra Fancy over U.S. Fancy apples shipped from the west were twice as great as those commanded by Extra Fancy over Fancy apples from the east.

Western Fancy grade apples brought only seven cents more than the Eastern Fancy apples (Table 9). However, a comparison of the prices paid for this grade of apples for each size shows that the eastern U.S. Fancy sold for higher average prices than western U.S. Fancy for most sizes of “Red” Delicious shipped to Cleveland.

A third comparison shows the average difference in prices paid for western Extra Fancy averaging \$.83 over the prices paid for eastern Extra Fancy (Table 9).

SIZES OF "RED" DELICIOUS BY GRADE

The 135 and 138 sizes were quoted more frequently than any other sizes in the U. S. Extra Fancy grade (Table 5). These sizes accounted for 22 percent of the observations for this grade of apples. The 80-92 sizes were the second most frequently quoted, accounting for 18 per-

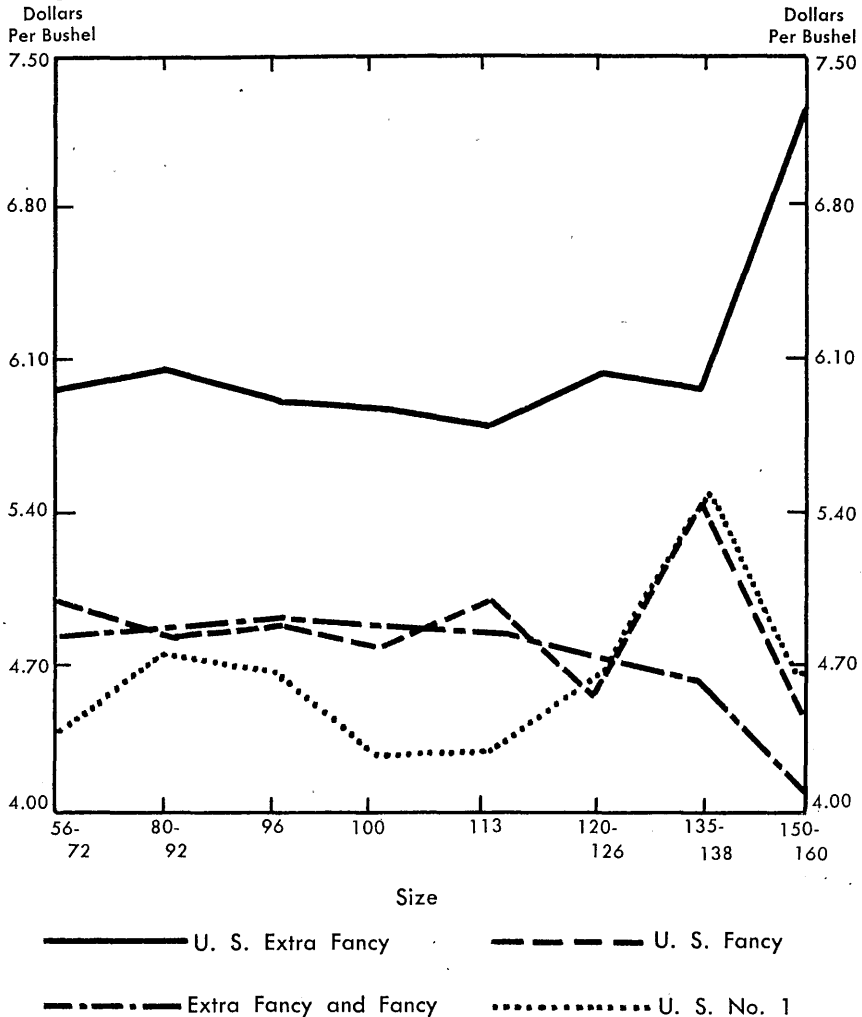


Fig. 1.—Average Prices, in Dollars Per Bushel, of U.S. Extra Fancy, Extra Fancy and Fancy, U.S. Fancy and U.S. No. 1 "Red" Delicious Apples, by Size.

cent. Extra Fancy 56's-72's, 96's, 100's, and 120's-125's each accounted for approximately 10 percent of the prices quoted. The small apple, sizes 150-160, were seldom found on the market.

The minimum sizes 2½ inches up and 3 inches up, graded U.S. No. 1, were quoted much more frequently than the count sizes marked with this grade. Fifty-seven percent of the price observations for "Red" Delicious graded U.S. No. 1 were packed by minimum sizes. The bulk of the observations for count sizes graded U.S. No. 1 were accounted for by sizes 100-113, and sizes 120-125.

PRICES OF "RED" DELICIOUS BY SIZE

Average prices paid per bushel for different sizes of U.S. Extra Fancy "Red" Delicious ranged from a high of \$7.34 to a low of \$5.80 (Table 12 and Figure 1). The average price paid for all sizes graded U.S. Extra Fancy was \$5.98 and the average deviation in prices paid per bushel between sizes was \$.23.

The highest priced sizes of U.S. Extra Fancy grade "Red" Delicious were the 150's-160's. They sold for an average price of \$7.34 per bushel. Sizes 80-92 selling on the average for \$6.04 per bushel were the second highest priced. Lowest prices, on the average, were paid for Extra Fancy size 113. The spread in prices between 150's-160's and 80's-92's was \$1.54 per bushel. However, if the 150's-160's are excluded the price spread from high to low would be only \$.24 per bushel and the average deviation in between sizes would be only seven cents. Even this small average price difference was statistically significant.

Size was also significantly related to prices paid for U.S. Extra Fancy "Red" Delicious.

Average prices paid per bushel for different sizes graded Combination Extra Fancy and Fancy ranged from a high of \$4.88 to a low of \$4.12 (Table 12 and Figure 1). The average price paid for all sizes of this grade was \$4.80 per bushel and the average deviation in prices paid between sizes was \$.14 per bushel. The highest priced size of Combination Extra Fancy grade "Red" Delicious was size 113.

Different sizes graded U.S. Fancy ranged from a high of \$5.46 to a low of \$4.38 with an average price of \$4.86 for all sizes and an average deviation in prices paid for different sizes of \$.22 a bushel. The highest price was reported on 135-138's sizes of U.S. Fancy apples.

ANALYSIS OF PRICES PAID FOR DIFFERENT METHODS OF PACKING WESTERN "RED" DELICIOUS

Western "Red" Delicious shipped to the Cleveland market during the period of this study were primarily tray packed¹ in cardboard cartons or wrapped² and placed in western³ boxes.

The tray pack was the most frequently used method of packing western "Red" Delicious apples. This method of packing accounted for 47 percent of the total number of price quotations for western "Red" Delicious, while wrapped "Red" Delicious accounted for 37 percent of the total (Tables 13 and 14).

For each grade, tray packed "Red" Delicious sold at higher prices than those that were wrapped (Tables 13 and 14).

Western U.S. Extra Fancy tray packed "Red" Delicious sold for an average price of \$6.89 per bushel while western Extra Fancy wrapped "Red" Delicious averaged \$5.71 per bushel. The resulting difference between average prices paid for the tray packed over the wrapped Extra Fancy Grade was \$1.18 per bushel. The price differential was even greater when certain sizes were singled out within a specific grade. For example, the average price paid for Extra Fancy tray packed 56's-72's was \$7.48 per bushel while the wrapped Extra Fancy 56's-72's sold for an average price of \$5.69 per bushel, a premium of \$1.66 for the tray packed fruit.

Western U.S. Fancy tray packed "Red" Delicious sold for an average price of \$5.43 per bushel while western U.S. Fancy wrapped ones averaged \$4.69 per bushel. The difference between these average prices was \$.74 per bushel.

ANALYSIS OF PRICES PAID FOR DIFFERENT METHODS OF PACKING EASTERN "RED" DELICIOUS

Eastern "Red" Delicious shipped to the Cleveland market were generally tray packed or packed face and fill.⁴ Price quotations on

¹Tray pack is a trade term used to describe a container, usually cardboard cartons, filled with apples placed individually in depressions on the surface of a flat sheet of compressed paper (Paper mache) called trays. These trays form layers within the carton.

²Wrapped—a trade term describing apples which have been individually wrapped in tissue paper and placed in a container in rows.

³Western box—a container made entirely of wood having inside dimensions of 10½ by 11½ by 18 inches.

⁴Face and fill describes a method of filling a container. The container is inverted and apples are placed in rows across the top. The container is then filled until container capacity is reached. The bottom of the container is then secured.

face and fill packed "Red" Delicious apples placed in western boxes were the only face and fill price quotations used in this study. That is, price quotations which gave the type of pack as face and fill for containers other than western boxes were too few to analyze.

Tray pack fruit accounted for 52 percent of the total number of price quotations for eastern "Red" Delicious while the face and fill packed "Red" Delicious accounted for 16 percent of the total quotations (Tables 13 and 14).

Average prices paid for tray packed eastern "Red" Delicious were less than those paid for the face and fill pack for each grade quoted.

Eastern U.S. Extra Fancy tray packed "Red" Delicious sold for an average price of \$5.54 per bushel while eastern U.S. Extra Fancy face and fill packed "Red" Delicious averaged \$5.81 per bushel. Thus, U.S. Extra Fancy packed face and fill averaged \$.27 more per bushel than tray packed apples of the same grade.

Eastern U.S. Fancy tray packed "Red" Delicious sold, on the average, for \$4.70 per bushel while eastern U.S. Fancy grade "Red" Delicious packed face and fill averaged \$5.50 per bushel. The difference between these average prices was \$.80 per bushel.

COMPARISON OF THE EFFECT OF TYPE OF PACK ON PRICES PAID FOR EASTERN AND WESTERN "RED" DELICIOUS APPLES

The difference between average prices paid for western tray packed over wrapped "Red" Delicious graded U.S. Extra Fancy was \$1.18 per bushel and the difference between average prices paid for tray packed over wrapped U. S. Fancy grade western "Red" Delicious was \$.74 per bushel.

Eastern growers should give some consideration to the method of packing their apples in preparation for shipment to the Cleveland market. Eastern Extra Fancy face and fill packed apples sold for a \$.27 higher price per bushel than the tray packed apples. An \$.80 higher price was paid for U.S. Fancy face and fill packed eastern "Red" Delicious over those packed in trays.

DELICIOUS

During the period of this study prices paid on the Cleveland market for western Delicious were, on the average, \$.86 per bushel higher than the prices paid for eastern Delicious. Western Delicious averaged \$5.46 per bushel while eastern Delicious sold on the average for \$4.60 per bushel. Over 90 percent of the western apples priced at Cleveland were graded U.S. Extra Fancy. Only 38 percent of the price quotations on eastern Delicious were for the Extra Fancy grades.

An additional 50 percent of the eastern Delicious marketed were graded U.S. Fancy or U.S. No. 1.

THE EFFECT OF GRADE ON PRICES PAID FOR EASTERN DELICIOUS APPLES

Eastern Delicious apples were marketed primarily in four grades: U.S. Extra Fancy, Combination Extra Fancy and Fancy, U.S. Fancy, and U.S. No. 1. The relative proportion each grade contributed to the total price quotations reported was as follows: U. S. Extra Fancy, 38 percent; Combination Extra Fancy and Fancy, 13 percent; U. S. Fancy, 25 percent; and U.S. No. 1, 23 percent.

Eastern Delicious graded U.S. Extra Fancy were highest in price at \$5.08 per bushel while those graded U.S. No. 1 were lowest at \$3.69 per bushel, a difference of \$1.39 per bushel.

Generally speaking, prices increased with quality as indicated by U.S. Grades. A notable exception to this price-grade relationship occurred between the prices paid for U.S. Fancy grade Delicious and the better Combination U.S. Extra Fancy and Fancy grade Delicious. The average prices paid for Delicious graded Combination Extra Fancy and Fancy were \$.82 less than the average prices paid for this variety of apple graded U.S. Fancy. U.S. Fancy grade Delicious sold for an average price of \$4.97 per bushel. Delicious graded Combination Extra Fancy and Fancy sold for an average price of \$4.15 per bushel (Table 6).

Table 6.—Number of Observations, and Average Prices of Delicious Apples with Eastern Origin by Grade, Crop Years 1954-1956
(Price in Dollars)

Grade	Number of Quotations	Average Price
U. S. Extra Fancy	458	5.08
Extra Fancy and Fancy	161	4.15
U. S. Fancy	305	4.97
U. S. No. 1	281	3.69
Total and Average	1205	4.60

Comparisons made between the eastern Delicious and eastern "Red" Delicious varieties indicate that better grades of Delicious than "Red" Delicious apple, were sold through the Cleveland market. Thirty-eight percent of the price quotations for eastern Delicious sold at

Cleveland were for apples graded U.S. Extra Fancy and 25 percent were for those graded U.S. Fancy. Only 22 percent of the price quotations for the "Red" Delicious variety were for apples graded Extra Fancy, while 36 percent were for "Red" Delicious graded U.S. Fancy (Table 12). Comparison of average prices paid, by grades, for apples of the two varieties shows the price differences to be greater between the U.S. Extra Fancy and U.S. Fancy grades of the "Red" Delicious variety than between the same grades of the Delicious variety. The difference in average prices paid for eastern "Red" Delicious graded U.S. Extra Fancy and those graded U.S. Fancy was \$.82 per bushel while the difference between prices paid for eastern Delicious graded U.S. Fancy was only \$.11 per bushel.⁵ Thus, the price premium paid for the U.S. Extra Fancy grade over the U.S. Fancy grade was greater for the eastern "Red" Delicious variety than for the eastern Delicious variety.

THE EFFECT OF GRADE ON PRICES PAID FOR WESTERN DELICIOUS APPLES

Two grades of western Delicious apples were shipped to the Cleveland market, U.S. Extra Fancy and U.S. Fancy.

A higher proportion of the better grades of Delicious apple was placed on the Cleveland market by western than by eastern shippers. Ninety-three percent of the western Delicious were graded U.S. Extra Fancy with the U.S. Fancy grade accounting for the remaining seven percent (Table 7). In contrast to this, only 38 percent of eastern Delicious were marketed U.S. Extra Fancy while 25 percent were marketed U.S. Fancy. Another 23 percent of the eastern Delicious were marketed as U.S. No. 1 grade.

**Table 7.—Average Prices, in Dollars Per Bushel, and Number of Observations of Western Delicious Apples by Grade, Crop Years 1954-1956
(Price in Dollars)**

Grade	Number of Observations	Average Price
U. S. Extra Fancy	1299	5.49
U.S. Fancy	102	5.15
Total	1401	5.46

⁵The average prices paid for U.S. Extra Fancy and U.S. Fancy eastern Delicious were tested by the use of "t test" and were found to be significantly different from each other.

The average price paid for western Delicious graded U.S. Extra Fancy was \$5.49 per bushel, while U.S. Fancy averaged \$5.15 per bushel; a margin of \$.34 per bushel for the higher grade.

A comparison is made here between the western Delicious and the western "Red" Delicious (Tables 4 and 7) varieties graded U.S. Extra Fancy and U.S. Fancy to point out the premiums paid, on the average, for top grade western apples. While the U.S. Extra Fancy grade Delicious sold for a premium of \$.34 per bushel over U.S. Fancy grade Delicious, U.S. Extra Fancy "Red" Delicious sold for a \$1.47 a bushel premium over U.S. Fancy fruit.

SIZES OF DELICIOUS BY GRADE

Some sizes of Delicious shipped to Cleveland were marketed only in one or two grades. During the three-year period covered by this study, most minimum sizes of Delicious were graded U. S. No. 1, while count sizes 150-160 and 56-72 were graded U.S. Extra Fancy or U.S. Fancy (Table 8).⁶

Table 8.—Number of Observations of Different Size Delicious Apples by Grades, Crop Years 1954-1956

Size of Apple	Grade				Total Observations by size
	U. S. Extra Fancy	Extra Fancy and Fancy	U. S. Fancy	U. S. No. 1	
	(Number of Observations)				
56-72	195	—	31	—	226
80-92	252	46	68	1	367
96	122	23	43	1	189
100	139	23	43	1	206
113	181	23	71	1	276
120-125	157	23	43	1	224
135-138	262	23	37	—	322
150-160	431	—	71	—	502
2½"-3" up	18	—	—	276	294
Total	1757	161	407	281	2606

Small sizes of Delicious apples graded U.S. Extra Fancy were quoted more frequently than large sizes. The 113-160 sizes accounted for 60 percent of the total price quotations for this grade and variety of apples. The most frequently quoted small sizes of Delicious were the

⁶There were only eighteen other price quotations on minimum sizes and they were for Delicious graded U.S. Extra Fancy.

150's-160's constituting 25 percent of the total price quotations. Large Extra Fancy Delicious apples were relatively scarce. Sizes 56-72 accounted for less than 10 percent of the total price observations (Table 8).

PRICES PAID FOR DELICIOUS BY SIZE

Variation in prices paid for different sizes of Delicious apples were significant only for those sizes graded Combination U.S. Extra Fancy

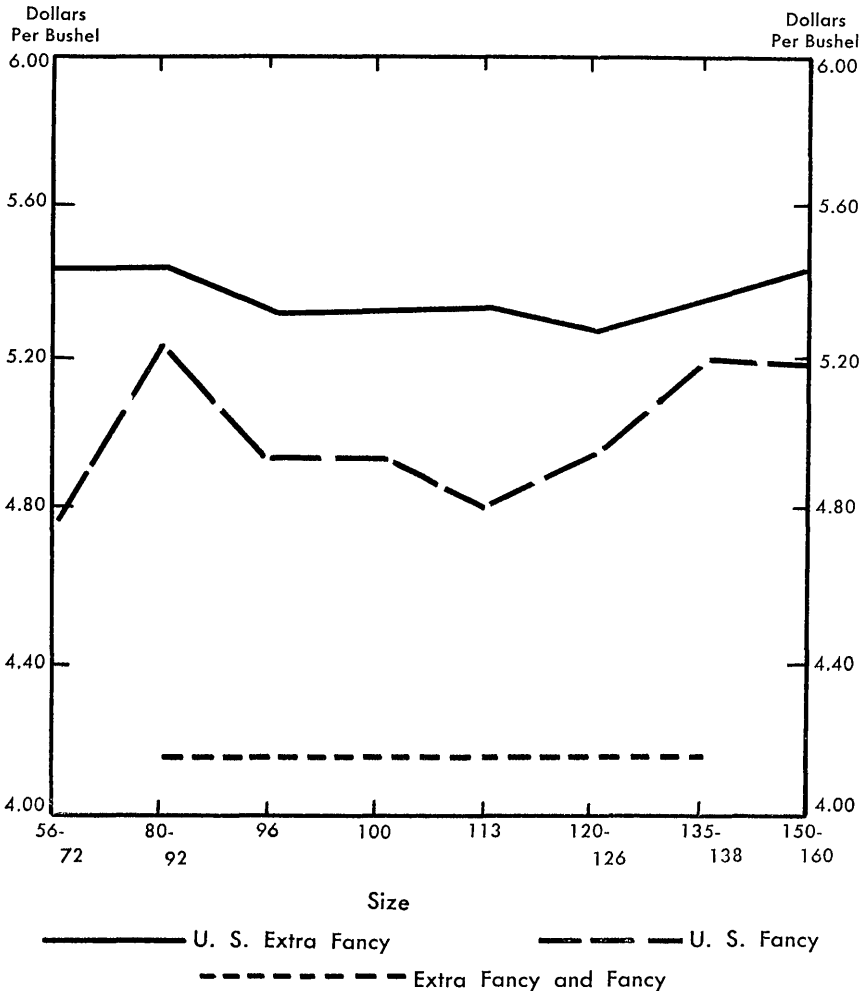


Fig. 2.—Average Prices, in Dollars Per Bushel, for Different Sizes of Delicious Apples, by Grade,

and U. S. Fancy. There was more variation in prices paid on the Cleveland market for different sizes of Delicious graded Combination Extra Fancy and Fancy (Figure 2).

The differences in prices paid for various sizes of U.S. Fancy grade Delicious were much greater than the difference in prices paid for similar sizes of Delicious graded U.S. Extra Fancy.

The high and low prices were both paid for large apples. Sizes 56-72, the largest sizes quoted, sold for a \$.49 lower average price than sizes 80-92. Another interesting relationship is that which exists between the relatively large sizes.

The price differences between sizes of "Red" Delicious were significant regardless of grade. However, prices did not vary between sizes of Delicious graded Combination Extra Fancy and Fancy, and the price differences which occurred between sizes of Delicious graded U.S. Fancy were nonsignificant. Thus, it is concluded that price was more highly associated with size for the "Red" Delicious than the Delicious apples.

COMPARISON OF PRICES PAID FOR SIMILAR SIZES OF EASTERN AND WESTERN DELICIOUS APPLES GRADED U.S. EXTRA FANCY

The size-price relationship for eastern U.S. Extra Fancy grade apples was different than the size-price relationship for western U.S. Extra Fancy apples.

Prices paid for eastern Delicious graded U.S. Extra Fancy decreased as the size of the apples marketed decreased from sizes 56-72 to sizes 150-160 (Table 9).

PRICES PAID FOR DIFFERENT METHODS OF PACKING EASTERN DELICIOUS

A specific method of packing was not always stated when reporting prices paid for Delicious apples. However, when a packing method was included with the price quotation it was primarily for apples tray packed in cardboard cartons or packed face and fill in western boxes (Tables 16 and 17).

The tray pack was the most frequently quoted method of packing eastern Delicious apples, regardless of grade and accounted for 80 percent of the total price quotations reported on tray and face and fill packs. Most all eastern Delicious apples graded U.S. Extra Fancy or U.S. Fancy⁷ were shipped to Cleveland packed in trays. Combination

⁷Prices were quoted for face and fill packed U.S. Extra Fancy grade and the U.S. Fancy grade eastern Delicious apples. However, lack of a sufficient number of price quotations prevented them from being used in this study.

**Table 9.—Average Prices, in Dollars Per Bushel, of Delicious Apples
by Size, Grade, and Origin, Crop Years 1954-1956**

Grade	Origin	Size								
		56-72	80-92	96	100	113	120-125	135-138	150-160	2 1/2 "-3" up
(Dollars per bushel)										
U. S. Extra Fancy	Western	5.46	5.61	5.74	5.62	5.50	5.45	5.47	5.42	5.23
	Eastern	5.44	5.20	5.05	5.05	5.05	4.44	4.44	—	—
Extra Fancy and Fancy	Western	—	—	—	—	—	—	—	—	—
	Eastern	—	4.15	4.15	4.15	4.15	4.15	4.15	—	—
U. S. Fancy	Western	—	—	—	—	—	—	5.15	5.15	—
	Eastern	4.74	5.23	4.93	4.93	4.82	4.93	—	—	—
U. S. No. 1	Western	—	—	—	—	—	—	—	—	—
	Eastern	—	—	—	—	—	—	—	—	3.67

Extra Fancy and Fancy grade eastern Delicious were packed face and fill in western boxes. Thus, comparisons between the tray and face and fill methods of packing were not feasible.

PRICES PAID FOR DIFFERENT METHODS OF PACKING WESTERN DELICIOUS APPLES

Western Delicious shipped to the Cleveland market during the period of this study were primarily tray packed or wrapped and placed in western boxes.

The tray pack method was most frequently quoted accounting for 80 percent of the total number of price quotations on both the tray packed and wrapped western Delicious apples.

U.S. Extra Fancy wrapped western Delicious sold for lower average prices than the same grade of apple packed in trays regardless of size. On the average, wrapped Extra Fancy apples sold for a \$.46 lower price per bushel than the tray packed apples.

McINTOSH

During the period of this study, McIntosh accounted for 35 percent of the total price quotations analyzed for the three varieties. When only eastern grown apples were considered, this percentage rose to 45 percent with McIntosh being quoted as many times as eastern "Red" Delicious.

The grade, type of pack and the container used to market the McIntosh variety were considerably different from those employed in marketing the "Red" Delicious and Delicious varieties. Only two grades of McIntosh were shipped to Cleveland with any frequency, whereas four grades of "Red" Delicious and Delicious are regularly for sale on this market. "Red" Delicious and Delicious were sized and packed primarily by count while price quotations for McIntosh were frequently for lots sized by the minimum diameter of apple in inches. Methods of packing employed for McIntosh apples were different also.

Analysis of this variety was broken into two parts: (1) Apples packed by count and (2) Apples packaged on a minimum diameter basis. The reason for this separation arises from the fact that greater care is taken in sorting apples packaged by count to insure that all apples in the package are uniform in size than is true for apples sized on the minimum diameter basis.

EFFECT OF GRADE ON PRICES PAID FOR McINTOSH APPLES

Two grades, U.S. Fancy and U.S. No. 1, accounted for practically

all graded⁸ McIntosh offered for sale on the Cleveland market. More McIntosh were graded U.S. Fancy than U.S. No. 1. Fifty-three percent of the sales reported on the McIntosh variety of apples were for those graded U.S. Fancy (Table 11).

Ninety-seven percent of the McIntosh graded U.S. Fancy were packed by count and three percent were packed on a minimum size basis.

Forty-seven percent of the total McIntosh sales reported were for apples marked with the U.S. No. 1 grade. Seventy-five percent of the McIntosh graded U.S. No. 1 were packed in containers on a minimum size basis while 25 percent were packaged on a count basis.

PRICE-GRADE RELATIONSHIP FOR COUNT SIZE PACKED McINTOSH

McIntosh graded U.S. No. 1 sold for an average market price of \$3.93 per bushel. McIntosh graded U.S. Fancy sold for an average price of \$3.66 per bushel (Table 17). This presents a striking situation, for buyers paid a \$.27 average premium for McIntosh graded U.S. No. 1 over the better grade (U.S. Fancy) of McIntosh.

Although these price differences are statistically significant they are not consistent either with logic or with observation of market prices. The premium for U.S. No. 1 over U.S. Fancy grades was greater in the small sizes (150-216 count) but was not confined to small apple sizes alone. In any case it is suspected that the apparently inconsistent price relationship was due to factors other than grade such as the marketing program of the seller and other factors which were related to grading practices.

PRICE-GRADE RELATIONSHIP FOR MINIMUM SIZE PACKED McINTOSH

The sales prices reported for McIntosh graded U.S. Fancy and sized to a minimum size were, on the average, higher than those with similar sizing but graded U.S. No. 1 (Table 10).

McIntosh graded U.S. Fancy sold for an average price of \$3.14 per bushel while those graded U.S. No. 1 averaged \$2.96 per bushel. These differences were statistically significant.

SIZES OF McINTOSH BY GRADE

The price variations existing between sizes within a specific grade were also significant.

⁸U. S. Extra Fancy, U. S. No. 2, and Orchard Run grades of McIntosh were also marketed, but the number of prices quoted were not sufficient to warrant being considered in this analysis.

Table 10.—Average Prices, in Dollars Per Bushel, and Number of Observations for Count and Minimum Sizes McIntosh Apples, by Grades, Crop Years, 1954-1956

Grade	Number of Quotations	Average Price
	Count Sizes	
U. S. Fancy	2753	\$3.66
U. S. No. 1	617	3.93
Total	3370	3.71
	Minimum Sizes	
U. S. Fancy	87	3.14
U. S. No. 1	1894	2.96
Total	1981	2.97

Size of apple affected price. No rigid relationship between size of apple and price existed, since the size of apple commanding the highest price in one grade might have sold for the lowest price in another grade. Certain sizes were quoted more frequently than others in a

Table 11.—Number of Price Quotations for Different Sizes of McIntosh Apples, by Grade

Size of Apple	Grade		Total
	U. S. Fancy	U. S. No. 1	
	Count Size		
72-88	143	—	143
96-113	1186	313	1499
120	266	—	266
125	253	85	338
133-140	444	74	518
150-216	461	145	606
Total	2753	617	3370
	Minimum Size		
2 1/4 " - 2 1/2 "	—	155	155
2 1/2 " - 2 3/4 "	—	107	107
2 1/4 " up	74	596	670
2 1/2 " up	13	1036	1049
Total	87	1894	1981

specific grade and it was not uncommon to find some sizes present in one grade and not in the other (Table 11).

COUNT SIZE PACKED McINTOSH

The most frequently quoted count sizes of McIntosh were the 96's-113's followed in terms of number of price observations by a group of very small size apples ranging in size from 150's-216's (Table 11). Percentage-wise, the 96's-113's accounted for practically one-half of the price quotations made on count sizes while the very small apples, 150's-216's, accounted for 18 percent of total quotations of McIntosh graded U.S. Fancy. Sizes 96-113 were also the most often quoted counts graded U.S. No. 1.

MINIMUM SIZE PACKED McINTOSH

The 2½ inch up size was the most frequently quoted minimum size McIntosh apple sold through the Cleveland market and accounted for 52 percent of the total price quotations reported for this method of sizing. The 2¼ inch up size accounted for 34 percent of the minimum size price quotations. The remainder was accounted for by the stated minimum-maximum sizes, 2¼ inch-2½ inch and 2½ inch-2¾ inch.

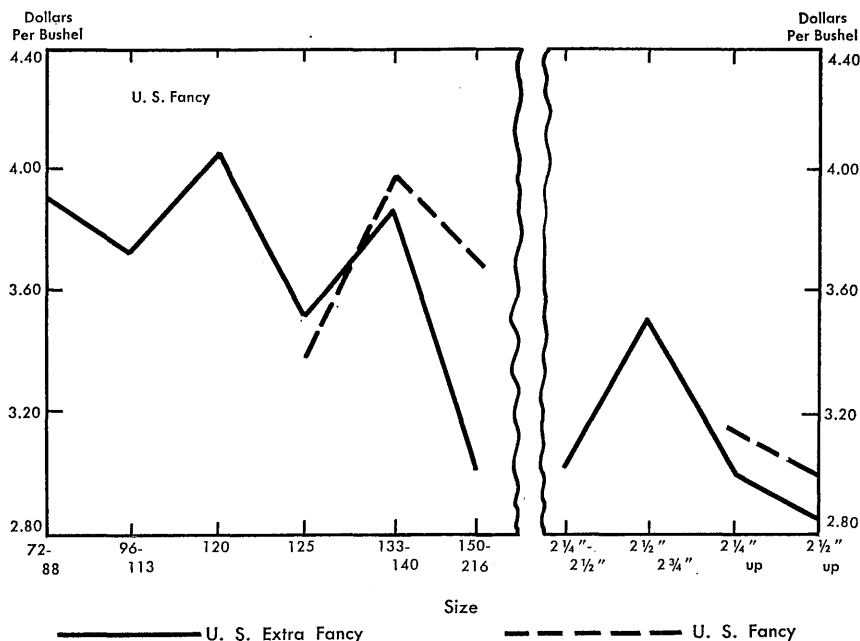


Fig. 3.—Average Prices, in Dollars Per Bushel, of U.S. Extra Fancy and U.S. Fancy McIntosh Apples by Size.

**Table 12.—Number of Observations, Average Price and Average Price Deviations, in Dollars Per Bushel, for Different Sizes of "Red" Delicious Apples, by Grades, Crop Years 1954-1956
(Price in Dollars)**

Size of Apple	Grade											
	U. S. Extra Fancy			Extra Fancy and Fancy			U. S. Fancy			U. S. No. 1		
	Observation	Average Price	Average Deviation	Observation	Average Price	Average Deviation	Observation	Average Price	Average Deviation	Observation	Average Price	Average Deviation
56-72	361	\$5.98	\$.00	104	\$4.84	\$.04	163	\$4.97	\$.11	4	\$4.32	\$— .22
80-92	525	6.04	.06	132	4.66	.06	433	4.85	— .01	55	4.74	.20
96	261	5.92	— .06	80	4.88	.08	342	4.86	0.00	53	4.68	.14
100	324	5.89	— .09	86	4.86	.06	373	4.79	— .07	124	4.28	— .26
113	492	5.80	— .18	87	4.86	.06	169	4.99	.13	113	4.30	— .24
120-125	301	6.02	.04	76	4.76	— .04	379	4.50	— .36	149	4.60	.06
135-138	669	6.00	.02	164	4.63	— .07	340	5.46	.60	36	5.44	.90
150-160	50	7.34	1.36	4	4.12	— .68	152	4.38	— .48	6	4.42	— .12
Total	2983	5.98	.23	733	4.80	.14	2351	4.86	.22	540	4.54	.27

Table 13.—Number of Observations and Average Prices, in Dollars Per Bushel, of Eastern and Western Tray Pack "Red" Delicious Apples, by Grades, and Sizes, Crop Years 1954-1956
(Price in Dollars)

Size of Apple	Eastern						Western	
	U. S. Extra Fancy		U. S. Fancy		U. S. No. 1		U. S. Extra Fancy	
	Observations	Average Price	Observations	Average Price	Observations	Average Price	Observations	Average Price
56-72	98	\$5.89	26	\$5.52	—	\$ —	55	\$7.48
80-92	174	5.70	257	4.73	49	4.77	125	7.26
96	103	5.51	227	4.68	50	4.70	45	7.68
100	90	5.49	258	4.60	121	4.28	68	6.99
113	205	5.42	54	4.84	110	4.30	73	6.92
120-125	—	—	293	4.39	146	4.60	165	6.47
135-138	103	5.28	212	5.40	28	5.41	268	6.52
150-160	—	—	144	4.36	—	—	37	7.98
Total	785	5.54	1471	4.70	504	4.53	836	6.89

Table 14.—Number of Observations and Average Prices, in Dollars Per Bushel, of Eastern and Western "Red" Delicious Apples in Western Boxes* by Grades and Sizes, Crop Years, 1954-1956
(Price in Dollars)

Size of Apple	Eastern						Western			
	U. S. Extra Fancy		Extra Fancy and Fancy		U. S. Fancy		U. S. Extra Fancy		U. S. Fancy	
	Observations	Average Price	Observations	Average Price	Observations	Average Price	Observations	Average Price	Observations	Average Price
56-72	29	\$5.82	40	\$4.49	51	\$5.07	62	\$5.69	76	\$4.69
80-92	34	5.82	56	4.62	73	5.36	70	5.68	76	4.69
96	12	5.81	36	4.70	57	5.70	38	5.67	38	4.69
100	12	5.81	35	4.70	57	5.70	46	5.64	38	4.69
113	24	5.81	36	4.70	57	5.70	48	5.71	38	4.69
120-125	—	—	28	4.53	28	5.04	57	5.66	38	4.69
135-138	13	5.75	92	4.40	56	5.72	101	5.83	—	—
150-160	—	—	4	4.12	—	—	—	—	—	—
Total	124	5.81	327	4.56	379	5.50	422	5.71	304	4.69

*Western apples in western boxes are wrapped. Eastern apples in western boxes are not wrapped.

Table 15.—Number of Observations, Average Prices and Average Price Deviations, in Dollars Per Bushel, by Grade for Different Sizes of Delicious Apples, Crop Years 1954-1956--
(Price in Dollars)

Size of Apple	Grade											
	U. S. Extra Fancy			Extra Fancy and Fancy			U. S. Fancy			U. S. No. 1		
	Observations	Average Price	Average Deviation	Observations	Average Price	Average Deviation	Observations	Average Price	Average Deviation	Observations	Average Price	Average Deviation
56-72	195	\$5.45	\$— .07	—	\$ —	\$ —	31	\$4.74	\$— .27	—	\$ —	\$ —
80-92	252	5.43	.05	46	4.15	.00	68	5.23	.22	1	4.91	.00
96	122	5.34	— .04	23	4.15	.00	43	4.93	— .08	1	4.91	.00
100	139	5.33	— .05	23	4.15	.00	43	4.93	— .08	1	4.91	.00
113	181	5.32	— .06	23	4.15	.00	71	4.82	— .19	1	4.91	.00
120-125	157	5.27	— .11	23	4.15	.00	43	4.93	— .08	1	4.91	.00
135-138	262	5.36	— .02	23	4.15	.00	37	5.19	.18	—	—	—
150-160	431	5.42	.04	—	—	—	71	5.17	.16	—	—	—
2 1/2 "-3" up*	18	5.23	— .15	—	—	—	—	—	—	276	3.67	—1.24
Total	1739	5.38	.06	161	4.15	.00	407		.16	5	—	.00

*This size group was not included in the totals nor was it used in calculating an average price.

Table 16.—Number of Observations, Average Price, in Dollars Per Bushel, Delicious Tray Packed Apples, by Origin, Grade and Size, Crop Years 1954-1956
(Price in Dollars)

Size of Apple	Eastern				Western			
	U. S. Extra Fancy		U. S. Fancy		U. S. Extra Fancy		U. S. Fancy	
	Observations	Average Price	Observations	Average Price	Observations	Average Price	Observations	Average Price
	Observations	Average Price	Observations	Average Price	Observations	Average Price	Observations	Average Price
56-72	80	\$5.44	31	\$4.74	79	\$5.57	—	\$ —
80-92	111	5.20	68	5.23	104	5.74	—	—
96	69	5.05	43	4.93	52	5.74	—	—
100	69	5.05	43	4.93	52	5.74	—	—
113	69	5.05	71	4.82	52	5.74	—	—
120-125	27	4.44	43	4.93	53	5.74	—	—
135-138	27	4.44	3	5.57	168	5.55	34	5.15
150-160	—	—	3	5.57	287	5.52	68	5.15
2½"-3" up	—	—	—	—	—	—	—	—
Total	452	5.08	305	4.97	847	5.61	102	5.15

COUNT SIZE PACKED McINTOSH

The average price paid for all count pack sizes was \$3.66 and the average deviation in prices paid was \$.29 per bushel (Figure 3 and Table 18).

The highest priced count pack size of McIntosh graded U.S. Fancy was the 120 size which averaged \$4.04 per bushel (Table 18). The 72-88 count pack sizes were second highest, selling at \$3.91 per bushel. Lowest average prices were paid for the 150-216 sizes. The 150-216 count sizes sold for an average price of \$3.00 per bushel. A group of large apple sizes, 72's-88's, and a group of small sizes, 133's-140's, sold for approximately the same average prices per bushel. Sizes 72-88 averaged \$3.91 per bushel while the 133-140 sizes sold on the average for \$3.88 per bushel. The resultant three cents difference between these average prices was not significant. However, price differences among all other sizes were significant.

Average prices paid per bushel for U.S. No. 1 grade count size McIntosh ranged from a high of \$4.18 per bushel for 96-113 sizes to a low of \$3.38 per bushel for the 125 count size. The average price paid for all U.S. No. 1 grade, count-sized McIntosh was \$3.93 per bushel and the average deviation in prices paid among sizes was \$.26 per bushel (Figure 3).

Table 17.—Number of Observations, Average Prices, In Dollars Per Bushel, Delicious Wrapped Apples, Western Box, by Origin, Grade, and Size, Crop Years 1954-1956

(Price in Dollars)

Size of Apples	Eastern Extra Fancy and Fancy		Western U. S. Extra Fancy	
	Observations	Average Price	Observations	Average Price
56-72	—	\$ —	36	\$5.23
80-92	46	4.15	36	5.23
96	23	4.15	—	—
100	23	4.15	17	5.24
113	23	4.15	21	5.25
120-125	23	4.15	35	5.21
135-138	23	4.15	13	5.37
150-160	—	—	38	5.22
2 1/2 "-3" up	—	—	18	5.23
Total	161	4.15	214	5.24

MINIMUM SIZE PACKED McINTOSH

Minimum size packed McIntosh graded U.S. No. 1 were marketed at an average price of \$2.96 per bushel. Average prices paid for the different sizes ranged from a high of \$3.53 per bushel for the 2½ inch-2¾ inch size to a low of \$2.86 per bushel for the 2½ inch up size, giving a total spread between the high and low price of \$.67 per bushel. The variation in prices paid for different minimum sizes was significant.

Comparison of the average prices paid for minimum sized and count sized McIntosh indicates that growers sorting the 2½ inch up size graded U.S. No. 1 could have obtained still greater returns by selling on a count size basis. Count sizes 150-160 marked U.S. No. 1 averaged \$3.71 per bushel while the 2½ inch up size sold for an average price of \$2.86 per bushel.

METHODS OF PACKING McINTOSH AND THEIR EFFECT ON PRICES

Three methods of packing were analyzed in an effort to determine which one was most desirable to employ in packing McIntosh of a specific grade and size. Cell packed,⁹ and tray packed, and apples packed in film¹⁰ bags were the three methods considered. To determine price effect, the tray and cell methods of packing McIntosh were analyzed separately from the film bag method of packing since counts were not packed in film bags and the minimum sized apples were not tray or cell packed.

CELL PACKED AND TRAY PACKED McINTOSH

Seventy-five percent of the total price quotations for these two methods of packing were for cell packed McIntosh. Both U.S. Fancy and U.S. No. 1 grades of McIntosh were cell packed. However, 90 percent of the price quotations for the cell pack were for McIntosh graded U.S. Fancy while 56 percent of the tray packed McIntosh were graded U.S. Fancy.

Cell packed U.S. Fancy grade apples averaged \$3.72 per bushel

⁹Cell pack is a trade term used to designate apples packed in individual compartments formed by partitions of cardboard. The size of the cell is varied to accommodate various sizes of apples. There are usually 16, 24, 25, 30, or 42 cells per unit. These units are placed by layers in a cardboard master container; usually three, four or five layers to a carton. Each layer is separated by compressed paper layer pads.

¹⁰Film bags is a trade term referring to pre-packaged apples packed in plastic or polyethylene bags. These bags are transparent making the contents visible.

Table 18.—Number of Observations, Average Prices and Average Price Deviations, in Dollars Per Bushel, by Grade, For Different Sizes of McIntosh Apples, Crop Years 1954-1956
(Price in Dollars)

Size	Observations	Grade				
		U. S. Fancy		U. S. No. 1		
		Average Price	Average Deviation	Observations	Average Price	Average Deviation
72-88	143	\$3.91	\$+.25	—	\$ —	\$ —
96-113	1186	3.74	+.08	313	4.18	+.25
120	266	4.04	+.38	—	—	—
125	253	3.53	— .13	85	3.38	— .55
133-140	444	3.88	+.22	74	3.97	+.04
150-216	461	3.00	— .66	145	3.71	— .22
Total	2753	3.66	.29	617	3.93	.26
2 ¼ "-2 ½ "	—	\$ —	\$ —	155	\$3.02	\$+.06
2 ½ "-2 ¾ "	—	—	—	107	3.53	+.57
2 ¼ " up	74	3.16	+.02	596	3.01	+.05
2 ½ " up	13	3.02	— .12	1036	2.86	— .10
Total	87	3.14		1894	2.96	.20

compared with \$3.16 per bushel for tray packed apples of this grade or a premium of \$.56 (Table 19).

Average prices for different sizes of U.S. Fancy grade cell packed McIntosh ranged from a high of \$4.03 per bushel paid for the 120 size down to a low of \$2.95 per bushel paid for the 150-216 sizes, giving a spread between high and low prices of \$1.03 per bushel.

In the tray pack, only sizes 76-113 and size 125 were reported often enough during the period of this study to permit making price comparisons with any degree of confidence (Table 19). Sizes 96-113 sold for a \$.13 premium over the smaller size 125. Sizes 96-113 sold for an average price of \$3.01 per bushel while the 125 size averaged \$3.14 per bushel.

Cell packed apples graded U.S. No. 1 were also higher priced on the average than tray packed apples of the same grade. Cell packed McIntosh graded U.S. No. 1 sold, on the average, for \$4.52 per bushel while tray packed U.S. No. 1 grade McIntosh averaged \$3.44 per bushel or \$1.08 per bushel more.

**Table 19.—Number of Observations, and Average Prices, in Dollars Per Bushel, for Cell Pack and Tray Pack, U. S. Fancy and U. S. No. 1 McIntosh Apples, by Size, Crop Years 1954-1956
(Price in Dollars)**

Size of Apple	U. S. Fancy				U. S. No. 1			
	Cell Pack		Tray Pack		Cell Pack		Tray Pack	
	Observations	Average Price	Observations	Average Price	Observations	Average Price	Observations	Average Price
72-88	110	\$3.86	2	\$3.77	115	\$4.96	174	\$3.48
96-113	791	3.92	289	3.14	1	2.93	—	—
120	261	4.03	4	4.16	36	4.31	82	3.36
125	93	2.99	129	3.01	65	3.88	37	3.59
133-140	433	3.87	6	4.02	—	—	69	3.32
150-216	437	2.95	24	3.91	—	—	—	—
Total	2125	3.73	454	3.16	217	4.52	362	3.44

A comparison of prices paid for tray and cell packed apples graded U. S. No. 1 by size revealed a larger range in prices paid for different sizes of cell packed apples. The range in average prices paid for cell pack apples was from a high of \$4.96 per bushel for sizes 72-88 to a low¹¹ of \$3.88 per bushel for the 120 size. For tray packed McIntosh, price ranged from a high of \$3.59 per bushel for the 120 size to a low of \$3.32 per bushel for the 133-140 sizes.

The average price premiums paid for cell packed over tray packed McIntosh graded U.S. No. 1 were more pronounced for certain sizes. Premium of \$1.48 per bushel was paid for cell packed sizes 72-80 over the same sizes packed in trays.

Table 20.—Number of Observations, and Average Prices, in Dollars Per Bushel, by Grade and Size for McIntosh Packed in Film Bags, Crop Years 1954-1956

(Price in Dollars)

Size of Apples	U. S. Fancy		U. S. No. 1	
	Observations	Average Price	Observations	Average Price
2 1/4 "-2 1/2 "	—	\$ —	155	\$3.02
2 1/2 "-2 3/4 "	—	—	107	3.53
2 1/4 " up	74	3.16	396	3.02
Total	74	3.16	658	3.10

MCINTOSH PACKED IN FILM BAGS

All price quotations on film bags were for apples packed on a premium size or minimum and maximum size basis (Table 20). Approximately 90 percent of the McIntosh packed in film bags were graded U.S. No. 1 with the U.S. Fancy grade accounting for only 10 percent of the total.

The average prices paid for the 2 1/2 inch-2 3/4 inch size U.S. No. 1 apples was the highest for film bagged McIntosh with an average price of \$3.53 per bushel compared with \$3.02 per bushel for the 2 1/4 inch-2 1/2 inch and 2 1/4 inch up sizes of the same grade.

¹¹The lowest price recorded was \$2.93 per bushel for the 96-113 size group. However, there was only one price quoted for this size which prevented the 96-113 sizes from being considered.

SUMMARY

This study describes a few of the major apple price variations on the Cleveland Market and their apparent causes. Significant price variations were associated with differences in grade, pack, variety and size of apples. The difficulties lie in properly interpreting these preferences from the data available and in growing and marketing the fruit for which the market pays premium. The major findings follow:

1. Western "Red" Delicious apples sold for an average of \$1.17 per bushel more than eastern "Red" Delicious.

2. Western Delicious sold for \$.86 per bushel more than eastern Delicious.

3. Western "Red" Delicious were marked U.S. Extra Fancy Grade in 75 percent of the sales compared with 27 percent for eastern "Red" Delicious.

4. U.S. Extra Fancy grade Western "Red" Delicious brought a premium of \$1.47 above U.S. Fancy grade while for eastern "Red" Delicious the premium of U.S. Extra Fancy was only \$.71. For Delicious apples the premiums of the higher grade were \$.34 and \$.11 respectively.

5. Apple size was significantly related to apple prices but there was no consistent relationship between small and large size apples and prices.

6. Type of pack was related to price. For eastern U.S. Extra Fancy "Red" Delicious a premium of \$.80 a bushel was paid for apples in the face and fill in western boxes over those in trays. For western apples the tray brought higher prices than the western boxes.

7. Grades and packs of McIntosh differed from those for Delicious apples. The variety was more commonly packed under the U.S. Fancy or U.S. No. 1 grades and in the cell or tray pack.

8. Cell packed McIntosh sold for a \$.57 premium per bushel over the tray packed fruit for the Extra Fancy Grade and for a \$1.08 premium for U.S. No 1. grade.